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1918
no. 7
Engineering

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OFFICIAL PROCEEDINGS
Meeting of October, 1918

Volume XVII.
No. - - - 7

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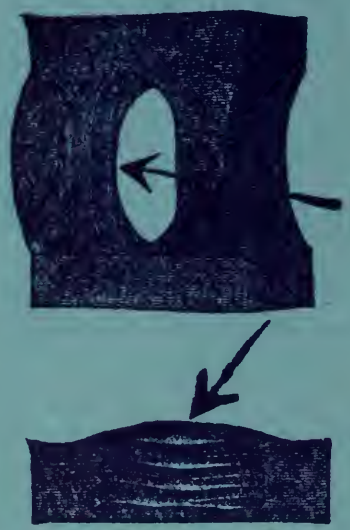

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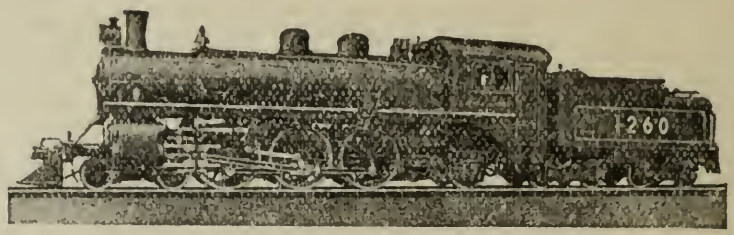

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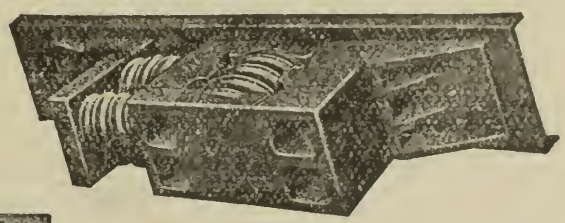

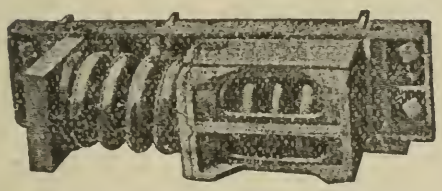

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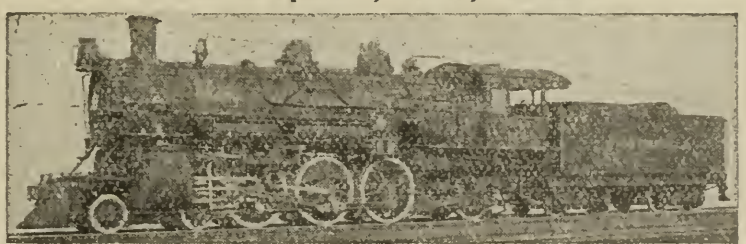

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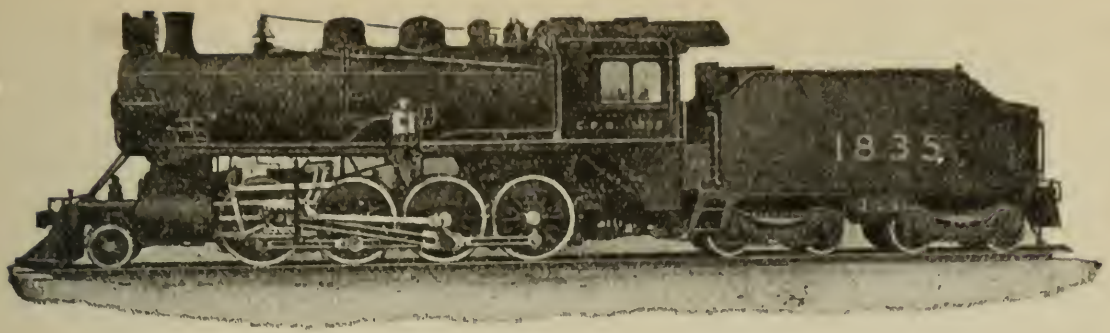

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JAMES POWELL, Secretary, 46 Aberdeen Ave., St. Lambert, near Montreal, P.Q.

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PROCEEDINGS OF THE CANADIAN RAILWAY CLUB.

October 8th, 1918.

The regular monthly meeting of the Canadian Railway Club was held at the Windsor Hotel, Montreal, on Tuesday, the 8th October, 1918.

Mr. T. C. Hudson in the chair.

Members Present.

W. E. Barnes	G. F. Henderson	H. W. Sharpe
C. W. Barrett	J. Hendry	C. Steeves
B. J. Berube	G. F. Hudson	E. R. Viberg
A. J. Candlin	J. St. Jean	C. Warnock
W. T. Coleman	Wm. Lister	G. Riddington
A. Crumpton	G. P. A. Mann	A. B. Wright
W. F. Graves	C. N. McNiely	James Powell
Wm. Gregory	A. S. Robertson, Jr.	and others
W. D. Hannah	E. M. Sawyer	

The chairman stated that before opening he desired to say that there appeared to be some misunderstanding among certain of the members as to whether—in view of the proclamation of the civic authorities forbidding public meetings on account of the prevailing influenza epidemic—any meeting would be held this evening; but after consulting with the manager of the hotel—who unfortunately had sent some of the members away under the impression that there would be no meeting—he had been advised that the meeting was legal; and that it had been decided that, in view of the routine business requiring attention, it would be better in the interests of the club to proceed with the meeting in the usual way; but that under the circumstances the Executive Committee had decided to recommend to this meeting that the reading of Mr. Appleton's paper, which had been fixed for to-night, be deferred until November.

The roll having then been called and cards signed by the members present, the minutes of the previous meeting, copies

of which had been forwarded to the members, were agreed to be taken as read and adopted.

The following applications for membership were submitted by the Secretary, who reported that they had been recommended for election by the Executive Committee:

Messrs. John G. Brisley, C. Burgin, John L. Devaney, James Dennigan, H. Murray Hannah, Robt. B. Kerrigan, H. E. Munro, H. W. Sharpe, C. Steeves, E. G. Theobald, George G. Wilding, and on motion of Mr. Hudson, seconded by Mr. J. Hendry, it was resolved that the applicants be elected to membership of the club and notified accordingly.

The meeting then proceeded to the election of officers to the places on the Executive Committee rendered vacant by the death of Mr. Van Buren and the resignation of Mr. Sample.

At this point Mr. Hudson left the chair, which was taken by Mr. Hendry, and the Secretary submitted the following nominations for the vacant offices with the recommendation of the Executive Committee that they be elected:

For President—Mr. T. C. Hudson, Master Mechanic, Canandian Northern Railway, Montreal.

For 1st Vice-President—Mr. J. Hendry, Master Car Builder, Grand Trunk Railway, Montreal.

For 2nd Vice-President—Mr. W. H. Winterrowd, Chief Mechanical Engineer, Canadian Pacific Railway, Montreal.

For Executive Committee—Mr. R. A. Payne, Supt. of Motive Power, Canadian Pacific Railway, Montreal; Mr. E. R. Battley, Supt. of Motive Power, Grand Trunk Railway, Montreal.

After discussion it was moved, seconded and unanimously resolved that the suggestions of the Executive Committee be accepted and that the above named gentlemen be elected to the offices mentioned by acclamation.

Mr. Hudson then took the chair as President, and after thanking the members for his election and making sympathetic reference to the unfortunate and untimely death of his predecessor, Mr. Van Buren, assured the meeting that he would use all his efforts to promote the success of the club, and requested their co-operation to that end.

Mr. Hendry also addressed the meeting in similar terms, thanking the members for his election as Vice-President.

The Secretary stated that Mr. Pyne and Mr. Battley, who had been elected to the Executive Committee, were not present but that he could vouch for their willingness to accept the positions.

The chairman again referred to the postponement of the reading of Mr. Appleton's paper, and stated that owing to Mr. Appleton's inability to attend on account of sickness he had deputed Mr. Barnes to attend specially at Montreal to read his paper. Several members expressed their regret at Mr. Appleton's absence, and it was moved, seconded and unanimously resolved that a vote of thanks be tendered to Mr. Barnes for his attendance.

The chairman expressed the hope that Mr. Appleton would be able to attend personally to read the paper at the next meeting and that in view of the distribution of the printed copies an interesting and useful discussion would be provoked.

There being no further business the meeting then adjourned.

"CO-ORDINATION OF THE VARIOUS BRANCHES OF THE MECHANICAL DEPARTMENT."

By W. U. Appleton, Supetrintendent of Motive Power, Canadian Government Railways, Moncton, N.B.

The subject of this paper is so extensive, it would be rather difficult to cover all its phases in one evening, and the writer has selected a few which he considers among the most important and hopes that with the resultant discussion, it may be of valuable assistance to those directly interested in arriving at a solution of many of the problems involved.

A system for regulating and combining the various branches of the Mechanical Department into one organization that will produce satisfactory service in the General Repair Shop and the Operating Department, obviously, must be broad and definite in its principles. Harmony between the various officers is essential and the relationship between the branches must be very intimate. Success cannot be obtained if the General Repair Shop and the Operating Departments are not closely allied, as if the Shop Superintendent is working with the one object "output" and the operating officers are not making every effort to obtain the greatest mileage from the locomotives consistent with good service and economy, failure is sure to result.

In order to get results, it is necessary that we should have that co-operation whereby the Shop Superintendent and all his subordinate officers are giving the same attention to proper

repairs as to output, and it should be the object and pride of every Master Mechanic and his subordinate officers to obtain the greatest mileage between shoppings with the least number of failures.

To repair a locomotive quickly, cheaply and properly, should be the ambition of the Shop Superintendent.

To maintain it in service with a minimum expense and the greatest number of miles between failures and shoppings, should be the aim and object of the Master Mechanic.

When locomotives are sent to the shop there should be some system of defining the class of repairs required, and the writer believes that three classes as described below is the best method from the different points of view and sufficient to take care of all repairs.

No. 1—Meaning general repairs, including a new firebox, a new cylinder or other such extra heavy repairs.

No. 2—Meaning ordinary general repairs.

No. 3—Meaning specific repairs that may be carried out at the roundhouse or shop.

Abbreviations as follows should be used in conjunction with the numbers to describe specific repairs:

No. 1 Repair	Convers.	means	conversion to superheater, etc.
	Boil.	"	new boiler.
	F. B.	"	firebox.
	Cyl.	"	cylinder (1 or 2).
	Fra.	"	frames.
	Int.	"	internal examination.
	Ext.	"	external.
	Der.	"	derailment.
No. 2 Repair	Int.	"	internal examination.
	Ext.	"	external.
	Der.	"	derailment.
	T.	"	new tires.
No. 3 Repair	T. T.	"	tires turned.
	Fr. W.	"	frame welded.
	An. T.	"	annual test.
	Int.	"	internal examination.
	TU.	"	fixing up tubes.
	DB.	"	driving boxes.
	Der.	"	derailment.

No. 1 or No. 2 Repairs should not indicate any difference in the condition of the locomotives when turned out of the shop as far as the Operating Department is concerned, as the

distinction is only made for the information and assistance of the shop force in effecting repairs, and either of these repairs should represent a locomotive in first class condition in every respect, and capable of making the standard mileage of its class, according to the physical characteristics of the division on which it is employed and the service it is in.

The condition of all parts of the locomotive should be as nearly balanced as possible in order to obtain the greatest mileage with the least loss of service, and it is false economy to turn locomotives out of the shop represented as having received the above classes of repair, with certain parts somewhat worn, due to having been renewed a short time previous to shopping. For instance, it may seem wasteful to renew tubes or some part of the machinery that is apparently still capable of making considerable mileage, but as these parts will become defective and make renewal necessary before those that were brought up to standard of shop practice, the result usually is: engine out of service when badly required—delay in effecting repairs—and higher cost of doing so on account of lack of facilities at engine-houses as compared with shops.

No.3.Repair—This differs entirely from those referred to. It represents specific work and may be done at engine-houses or shops, and is sometimes the result of an accident to or failure of some particular parts, but is generally due to ordinary wear and tear of certain parts of the locomotive that are subject to the most severe service.

The parts subject to the greatest wear would not, if the locomotive is properly maintained while in service, represent sufficient work to justify a No. 1 or No. 2 repair, and in order to enable these parts to continue their work until the locomotive is generally worn to the extent necessary to justify a shop repair, it is usually economical to effect such repairs.

The latter class of repair generally consists of partial renewal of tubes and flues, rod bearing work, lining up wedges, examination of pistons and valves, refitting main driving boxes and sometimes tire turning, and removal of lateral play from wheels. The parts requiring attention will, of course, be found to vary considerably with the different classes of locomotives as well as with the different classes of service they give and the subdivisions on which they are employed. In some classes of locomotives on some subdivisions the tubes and flues will run from shopping to shopping with very little trouble, while others on the same division, or the same class on other

NE 1ST 1918.

CEIVED GENERAL REPAIRS RING PAST YEAR.					GENERAL INFORMATION.	
FEB.	MAR.	APR.	MAY	JUNE		
413	401		415	420	NO. OF LOCOS' TRIBUTARY TO MONCTON SHOPS	
417	435	.	416	438	IN ROUNDHOUSE SERVICE	338
			421	446	IN REPAIR SHOPS & YARDS	31
			438	1917	TOTAL	369

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PACIFIC.	415	401	413	426	469	404		423		420	437	412	414	445	409	433	402	463		465	407					
	416	435	417	444		407				430	453	441	440	446	419	448	462	464			425					
	421		418	468							454			449		466	467									
	438																									
SANTA FE			2017																							
MIKADO.		2877	2869	2868	2900			2841	2805	2800	2801	2810														
		2879	2870	2911					2806	2803	2802															
		2881	2871	2912					2812	2808	2804															
			2872	2913					2817	2809	2807															
			2873	2914					2818	2811	2831															
			2875	2915					2836	2813	2834															
			2918	2916					2838	2814	2835															
			2919	2917					2842	2815																
				2920					2843	2816																
				2923					2844	2819																
				2926					2845	2821																
									2846	2820																
									2847	2822																
										2828	2837															
										2832	2839															
										2838	2840															
10-WHEEL.	643	615	613	601	605	612	603		606		602	617	623													
		627	626	604	607		620		609		621	645	644													
		629	646	608	622				624		637															
		640		618					625																	
									628																	
CONSOLIDATION 201 UP.	305	316	276	294	201	288	281	202	271	209	280	267	266	277	306	308	303									
	309	307	301	298	208		284	203	273	210	296	268				315	308									
					290		287	204		285	310	269														
					293		289	205				272														
					297		311	206				278														
					299			207																		
					300			270																		
158	1	4	10	2	3	48	42	12	21	8	50	11	55	114		5										
	6	13	25	18	83	57	74	14	24	53	77	16	66	140												

1000 MILES

64 LOCOS AVERAGE MILEAGE 36700

30 LOCOMOTIVES AVERAGE MILEAGE 35100
1 LOCO. WAITING OR REPORTED FOR REPAIRS

48 LOCOMOTIVES AVERAGE MILEAGE 43400
3 LOCOS WAITING OR REPORTED FOR REPAIRS.

41 LOCOMOTIVES AVERAGE MILEAGE 58500
2 LOCOS WAITING OR REPORTED FOR REPAIRS.

1 LOCOMOTIVE AVERAGE MILEAGE 8231

RECEIVED GENERAL REPAIRS DURING PAST YEAR.

JAN.	FEB.	MAR.	APR.	MAY	JUNE
418	413	401		415	420
444	417	435		416	438
				421	446
				438	1917

JULY	AUG.	SEPT.	OCT.	NOV	DEC.
430		404		447	426
		1917			

JAN.	FEB	MAR	APR	MAY	JUNE

JULY	AUG.	SEPT.	OCT.	NOV.	DEC.

JAN.	FEB.	MAR	APR	MAY	JUNE

JULY	AUG.	SEPT.	OCT.	NOV.	DEC

JAN.	FEB.	MAR.	APR	MAY	JUNE
615	626	629	640	643	603A

JULY	AUG	SEPT.	OCT.	NOV.	DEC.
626	607	604	608	613	601
		605	646	618	612
		622			627
		1917			

JAN.	FEB.	MAR.	APR	MAY	JUNE.
301	276	316	307	305	261A
				309	281A

JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
270	282	208	293	298	
284	283	300	297		
311			299		
		1917			

JAN.	FEB.	MAR.	APR	MAY	JUNE
73	4	61	6	56	98

GENERAL INFORMATION.

NO. OF LOCOS' TRIBUTARY TO MONCTON SHOPS
IN ROUNDHOUSE SERVICE 338
IN REPAIR SHOPS & YARDS 31
TOTAL 369

LOCO. MILEAGE FOR APRIL 1918
AVERAGE PER LOCO IN SERVICE 2392

11 LOCOMOTIVES SHOULD RECEIVE GENERAL REPAIRS PROPORTIONATE TO ABOVE MILEAGE EXCLUDING ACCIDENTS.

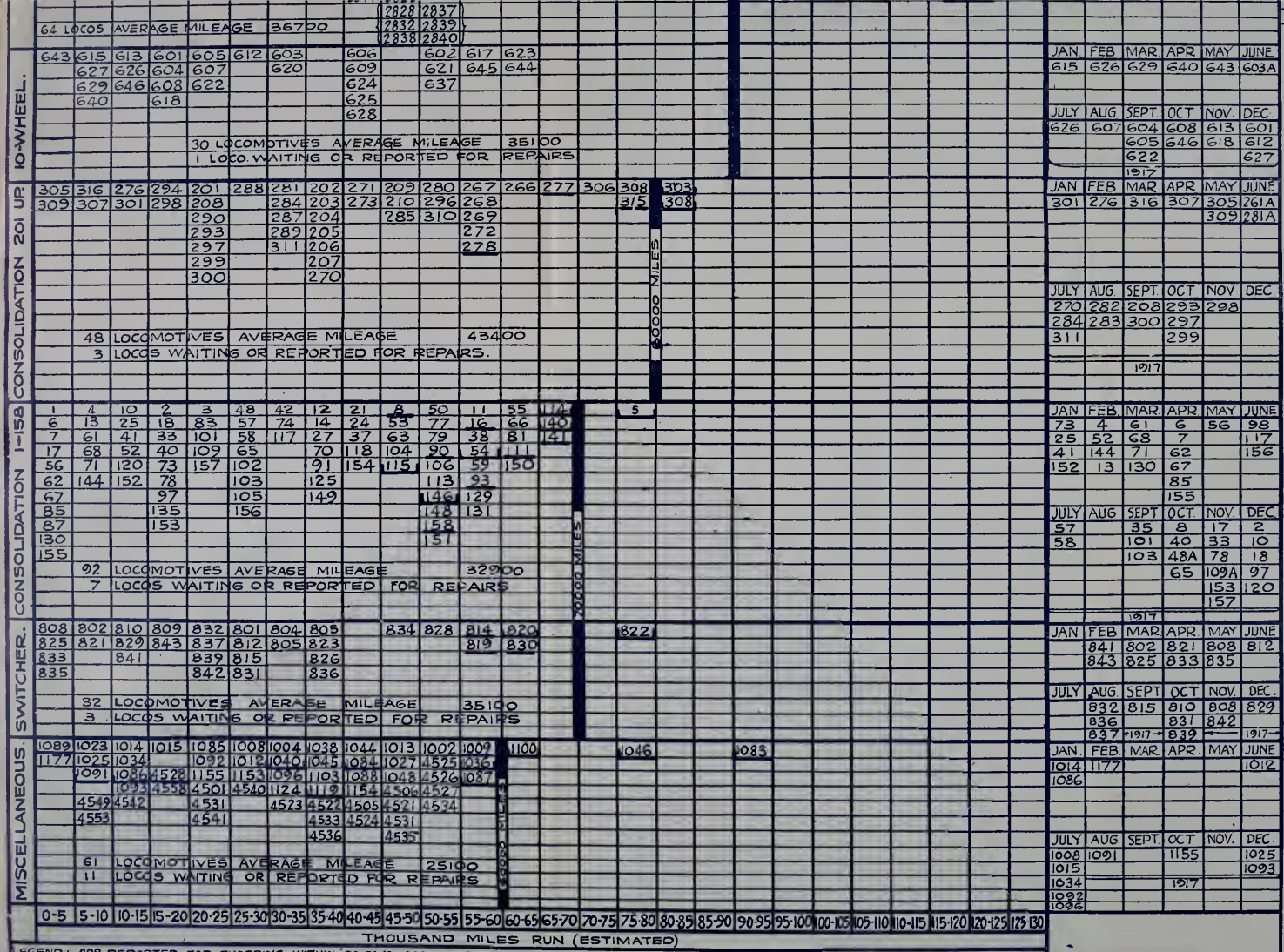
11 LOCOMOTIVES RECEIVED GENERAL REPAIRS AND 2 LOCOMOTIVES RECEIVED SPECIAL LIGHT REPAIRS DURING MAY 1918.

5 LOCOS SENT IN FOR GENERAL REPAIRS BEFORE MAKING STANDARD MILEAGE.

LOCO. NO.	MILEAGE	DIST.	LOCO. NO.	MILEAGE	DIST.
54	55725	4			
115	43454	6			
146	51821	2			
467	80337	3			
1040	27992	3			

LOCOMOTIVES REPAIRING & IN SHOP YARDS

WAITING REPAIRS			REPAIRING IN SHOP		
LOCO. NO	DATE OF ARRIVAL	WAITING FOR	LOCO NO	EXPECTED OUT	
1917					
1083	8-28		5	6-13	1918
1089	11-2		54	8-2	"
1087	8-10		67	6-19	"
1046	9-15		77	6-3	"
1918			114	6-16	"
414	5-10		115	6-25	"
615	4-10		140	7-3	"
1036	4-17		146	WAITING	FOR CYL.
1084	4-10		284	6-17	1918
1086	5-10		287	6-18	"
1091	1-9		288	6-18	"
1119	4-10		303	6-3	"
4528	4-24		308	6-5	"
M&B #3	4-29		407	6-18	"
			467	6-10	"
			820	6-8	"
			822	6-30	"
			1100	6-20	"
			1040	6-27	"


10-WHEEL.
64 LOCOS AVERAGE MILEAGE 36700
30 LOCOMOTIVES AVERAGE MILEAGE 35100
1 LOCO. WAITING OR REPORTED FOR REPAIRS
CONSOLIDATION 201 UP.
48 LOCOMOTIVES AVERAGE MILEAGE 43400
3 LOCOS WAITING OR REPORTED FOR REPAIRS.
60000 MILES
CONSOLIDATION 1-158
92 LOCOMOTIVES AVERAGE MILEAGE 32900
7 LOCOS WAITING OR REPORTED FOR REPAIRS
70000 MILES
SWITCHER.
32 LOCOMOTIVES AVERAGE MILEAGE 35100
3 LOCOS WAITING OR REPORTED FOR REPAIRS
MISCELLANEOUS.
61 LOCOMOTIVES AVERAGE MILEAGE 25100
11 LOCOS WAITING OR REPORTED FOR REPAIRS
60000 MILES
0-5 5-10 10-15 15-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60-65 65-70 70-75 75-80 80-85 85-90 90-95 95-100 100-105 105-110 110-115 115-120 120-125 125-130
THOUSAND MILES RUN (ESTIMATED)
LEGEND:- REPORTED FOR SHOPPING WITHIN 90 DAYS WAITING IN SHOP YARD FOR REPAIRS IN SHOP UNDER REPAIRS "A" DUE TO ACCIDENT.

WAITING REPAIRS			REPAIRING IN SHOP		
LOCO NO	DATE OF ARRIVAL	WAITING FOR	LOCO NO	EXPECTED OUT	
1917					
1083	8-28		5	6-13	1918
1089	11-2		54	8-2	"
1087	8-10		67	6-19	"
1046	9-15		77	6-3	"
1918			114	6-16	"
414	5-10		115	6-25	"
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1036	4-17		146	WAITING	FOR CYL.
1084	4-10		284	6-17	1918
1086	5-10		287	6-18	"
1091	1-9		288	6-18	"
1119	4-10		303	6-3	"
4528	4-24		308	6-5	"
M38 #3	4-29		407	6-18	"
			467	6-10	"
			820	6-8	"
			822	6-30	"
			1100	6-20	"
			1040	6-27	"

TOTAL NO OF LOCOMOTIVES WAITING OR REPORTED FOR REPAIRS :-
SERVICEABLE 27
UNSERVICEABLE, SUBJECT TO INSTRUCTIONS 7

8% OF SERVICEABLE LOCOMOTIVES UNDER REPAIRS & IN SHOP YARD WAITING.

NO OF LOCOMOTIVES SUPERHEATED DURING MONTH # 438.

division will require partial renewal when little more than half the required mileage has been accomplished.

The constant introduction of larger power is so changing conditions as to make the question of doing No. 3 repairs at engine-houses one of considerable controversy and the question naturally arises as to the best method of taking care of this work.

In the writer's opinion the No. 3 repair should be continued and not confused with the heavier repairs under classes 1 and 2, this being important in order to determine the condition of the power at all times based on mileage made according to class of repairs, and to avoid expenditures being made on the power that should not be necessary.

Facilities at engine-houses are generally inadequate to take care of this work except on the smaller and medium classes of power. At enginehouses where there is a heavy fluctuation in traffic it is an advantage to have a No. 3 repair gang, as it enables those in charge to hold their staff together and they can be employed to advantage on running repairs when necessary.

In general repair shops where the work is done on schedule and arranged so that the engines will be turned out at regular intervals and No. 3 repairs cannot be taken care of without interfering with the regular work, it is a debatable question as to the advisability of breaking up the organization in order to take care of this work, although under existing conditions there is usually no alternative.

The changing conditions will, no doubt, make it necessary to provide certain space in general repair shops for this class of work, where it may be done at lower cost than at engine-houses, but where locomotives have to be hauled or worked a long distance to get to the general repair shop for such repairs, it might be advisable to provide a small shop for this class of repair, if the number of engines tributary to the same is sufficient to justify it.

To enable the Shop Superintendent to plan his work and maintain his schedule, it is only fair that he should be given all the advice possible as to the class of repair, and a list of the important parts that require replacement at least 30 days in advance of the locomotive coming to the shop. While it may not always be possible to do this on account of engines being damaged in accidents, there is no reason why it cannot be done to a very large extent in ordinary service. A form for reporting the work, as shown below, has been found to be very satisfactory.

7-31-17-1M

Form 577

CANADIAN GOVERNMENT RAILWAYS

REPORT OF SHOP REPAIRS REQUIRED

Station.....Date.....

Mr. .....Ry.

General Master Mechanic.

Locomotive No.....requires the following repairs and should be shopped within .....days

Estimated class of repairs..... (See Main Card 99 M. R2.)

Give general description of repairs required and describe any special or unusual defect, particularly defective counterbalance, cracked cylinders and those defects which are difficult to discover when engine is in shop.

If No. 3 repair, describe fully what work is required to be completed in the shops.

STANDARD MILEAGE BETWEEN REPAIRS, EITHER NO. 1 OR NO. 2

Pacific	100,000	Ten-wheel	90,000
Consolidation, C1 Class	70,000	Switching	50,000 to 60,000, or 2 years' service
Consolidation, C2, 3 & 4 Classes	80,000		

Miles made since last No. 1 or No. 2 repair.....Mileage less or more than standard.....%

Class of Service..... .....To be repaired at.....

Estimated cost of repairs : Labor.....Material.....Total.....

Last No. 1 or No. 2 repair..... .....Place.....Class of repair.....

Cost: Labor.....Material.....Total.....Per mile.....

Date of last No. 3 repair.....Date of last Flexible Staybolt Examination .....

Date of last internal examination.....Date of last annual test .....

Date of last external examination.....

Engineman ..... Checked and signed, Foreman.....

General Boiler Inspector.....Master Mechanic.....

Shopping Approved: Cost and Mileage Clerk.....

....

General Master Mechanic Supt. Rolling Stock

Date.....

Actual cost of above repairs:

Labor.....Material.....Total.....Per Mile.....

When making out this report of shop repairs required, Master Mechanics should devote particular attention to the note advising them to describe any special or unusual defect.

We all know that when a group of engines is built from the same drawings, even though all the parts are duplicate in every respect, no two of these engines will behave alike in service, but that each individual machine will have its own peculiar virtues and vices. For instance, one engine may jig and ride badly, perhaps the fault is more apparent at certain speeds than at others, and again it may vary with the position of the reverse lever and according to whether the engine is working hard or light.

There are several things which might cause this trouble, and unless full particulars are given the real cause may be overlooked; but if the Master Mechanic will take particular care to describe the defect with all the symptoms he will give the Shop Superintendent a chance to determine the seat of the trouble.

On taking over an engine from the shop after repairs the Operating Department should keep a very sharp lookout for any defect which may be actually present or beginning to develop, and these defects should be completely reported to the Shop Superintendent within 30 days of the date the engine goes into service.

What too often happens is that the Operating Department will run the engine until there is a failure and then endeavor to throw the whole blame for the failure on the shops, whereas they are really as much to blame as the shops for not reporting the defect in good time.

There are some kinds of defects which often manifest themselves on an engine from the shops, which will disappead after a few days or a few weeks in service, and the Operating Department often makes the mistake of neglecting to report these defects, as they feel confident that the engine will come round to her work after a week or two in service. Very often their judgment proves correct, but the best policy in cases of this kind is to report the defect immediately, keep a strict watch on it and if no improvement is noticeable within a very short time the defect must be rectified to avoid any chance of engine failure.

The standard maintenance regulations in force on most roads, if faithfully carried out, will prevent a very large percentage of ordinary running failures, but there is a class of failure which cannot be guarded against by any such regu-

lations. I mean failures due to faulty design and poor material.

To deal with the failures of this kind is, obviously, the business of the Engineering Department, and their first and greatest effort should be to locate the prime cause of the failure. Very often the actual part which fails is not the part which is at fault, and if we go ahead blindly and strengthen this part, the evil will not only break out in another place, very likely with worse results, so that the maxim of the Engineering Department should be first to find the absolute root of the trouble and then rectify it.

Regarding the mileage that should be obtained from the different classes of locomotives:

To determine this, considerable study and investigation would be required, and, in the writer's opinion, a minimum mileage requirement should be established for all sub-divisions for the various classes of locomotives according to service, after receiving a No. 1 or No. 2 repair—and if this is not done there is every possibility of locomotives being shopped for expensive repairs before actually required, while others, overdue for shopping on a basis of work done, remain in service, a source of trouble and expense to everybody. We make tests and establish standards as to tonnage that locomotives of the same class shall haul and they are not arbitrary for all divisions irrespective of grades and curves—then why require a locomotive to make as much mileage with the same amount of repairs if in way-freight service on a heavy division as in through service on a light division?

Locomotives in assigned service will, I am satisfied, make more mileage at less cost than those in the pool, and in a given time—say 18 months—the assigned engine will possibly make the greater mileage, due to its receiving more care and attention which will keep it in continuous service; but in a rush of traffic for a short period the pooled engine will make the greater mileage. Where traffic is fairly steady I believe that the assigned system is the best, but where heavy fluctuations in traffic have to be met, it might entail too great a capital outlay. I have known a locomotive in assigned service, when the engineer was taking an interest in his work, to make 55% more mileage than a locomotive of the same class, in the same service and division, in the pool.

The movement of power from one division to another should be done only under the advice of the Motive Power Department, i. e., as far as selection of locomotives of the same class is concerned, otherwise it would possibly result in some

roundhouses having a high percentage of power over the shopping period and others with a similar proportion of power just out of the shop.

In order that we may have a comprehensive idea of the condition of our power at all times, the monthly statement reproduced below has proved to be of considerable value. The form is self-explanatory and it is easy to get an idea of the condition of any particular locomotive, of the general condition of a particular class of locomotive, of the number of locomotives due for shopping or shortly to become due for shopping and a host of other information.

Monthly Mileage Report of Engines Tributary to Moncton Shops, June 1st, 1918.

(*See Chart*)

It will be noticed that in the mileage set for different classes of locomotives to accomplish, there is no provision made for the class of service in which the locomotive is engaged, and it is therefore necessary sometimes to reduce the mileage required for locomotives working under severe conditions, such as way-freight service on a heavy division. It is a difficult and unsatisfactory matter to make rigid laws in cases of this kind and the rules are necessarily slightly elastic. elastic.

To sum up, I would like to say that co-operation between the various branches of the Mechanical Department depends very much more on the men than on the system, and if the heads of the different departments all pull together with the idea of attaining greater efficiency and their subordinates back them up to the full extent of their ability, it will not be difficult to get results.

The Operating Department should be very careful and very complete with their reports of repairs required when sending locomotives to the shop and should promptly report any defects in engines turned out of the shop.

The Shops Department should work conscientiously with the idea of making all locomotives good for their full mileage, and should pay special attention to any peculiar or unusual defects reported by the Operating Department.

The Engineering Department should be ready at all times with advice and assistance to the Shops and Operating Departments, and when investigating any defects should spare no pains to get right at the root of the trouble before attempting to eliminate it.

SUBJECTS AND AUTHORS OF PAPERS AT THE MEETINGS OF OTHER RAILWAY CLUBS.

NEW YORK RAILWAY CLUB.

HARRY D. VOUGHT, 95 Liberty Street, New York City, Secretary.

Sept. 14, 1917—"Electric Welding in Railroad Shops." By CHARLES H. FLORANDIN, General Sales Manager C. & C. Electric & Manufacturing Company.

Oct. 19, 1917—"Conservation of Material." By M. K. BARNUM, Assistant to Vice-President, B. & O. R. R.

Nov. 16, 1917—"The Woman in Railroad Work." By STUART BRADY, Special Agent, P. B. & W. R. R.

Dec. 21, 1917—Patriotic Rally. Addresses by EUGENE CHAMBERLIN and the HON. GEORGE A. POST.

Jan. 18, 1918—"Activities of the National Association of Corporation Schools." By F. C. HENDERSCHOTT, Executive Secretary.

Feb. 15, 1918—"Dynamite Augment—Need and Means of Reducing It." By E. W. STRONG, American Vanadium Company.

Mch. 15, 1918—Annual Electric Night. Papers by E. R. HILL, of Gibbs & Hill, Consulting Engineers for the N. Y. N. H. & H. R. R. F. H. SHEPARD, Director of Heavy Traction, Westinghouse E. & M. Co., A. H. ARMSTRONG, General Electric Company, E. B. KATTE, C. E., Electric Traction, N. Y. C. R. R.

Apr. 19, 1918—"Thermit Welding." By R. L. BROWNE, Engineer, Metal & Thermit Corporation.

May 17, 1918—"A Description of and the Efficiency of the Imperial Tie Tampers." By GEORGE W. VAUGHAN, Engineer Maintenance of Way, N. Y. C. R. R.

CENTRAL RAILWAY CLUB.

HARRY D. VOUGHT, 95 Liberty Street, New York City, Secretary-Treasurer.

Sept. 14, 1917—"The Relation of Air Compressor Capacity to Brake Pipe Leakage." By C. H. WEAVER, Supervisor of Air Brakes, N. Y. C. R. R.

Nov. 9, 1917—"Conservation." By J. P. MURPHY, G. S. K., N. Y. C. R. R.

Jan. 10, 1918—"Equipment Department of a Railroad and Advantages it Offers to Young Men Who Want to Follow a Mechanical Line." By F. W. BRAZIER, S. R. S., N. Y. C. R. R.

Mch. 8, 1918—Annual Report of the Committee on Rules of Interchange. "Terminal Handling of Locomotives." By FRANK C. PICKARD, M. M., D. L. & W. R. R.

May 10, 1918—"Radiant Heat and Firebox Design." By J. T. ANTHONY, Assistant to the President, American Arch Company.

WILLIAM E. CADE, JR., 683 Atlantic Ave., Boston, Mass., Secretary.

Oct. 9, 1917—"The Freight Car—A Factor in Winning the War." By E. H. DEGROOT, JR., of the Interstate Commerce Commission.

Nov. 13, 1917—"Ordering, Distribution and Use of Supplies." By GEORGE G. YEOMANS, Purchasing Agent, N. Y. N. H. & H. R. R.

Dec. 11, 1917—"Fuel Standards, or Methods for Following Individual Locomotive Fuel Performance." By W. L. ROBINSON, Supervisor Fuel Consumption, B. & O. R. R.

Jan. 8, 1918—"The Internal Strains in Steel Rails." By JAMES E. HOWARD, Engineer Physicist, Interstate Commerce Commission.

Feb. 12, 1918—"Manufacture and Use of Chilled Iron Wheels." By F. K. VIAL, Chief Engineer, Griffin Wheel Company.

Mch. 12, 1918—Annual Meeting, Election of Officers and Reports, together with Annual Entertainment.

Apr. 9, 1918—"Brake Conditions in General Freight Service and Their Relation to Shocks and Break-In-Twos." By H. F. WOOD, Supervisor Air Brakes, B. & M. R. R.

May 14, 1918—"Labor Saving Devices for Track Maintenance." By E. STIMSON, Engineer Maintenance of Way, B. & O. R. R.

ST. LOUIS RAILWAY CLUB.

B. W. Frauenthal, Union Station, St. Louis, Mo., Secretary-Treasurer.

May 11, 1917—"The Safety Appliance Standards, Their Purpose and the Reasons Underlying Their Fixed and Definite Location." By Hiram W. Belknap, Chief of the Division of Safety, Interstate Commerce Commission.

June 8, 1917—"Car Interchange." By Chas. Burlingame, Supt., The Wiggins Ferry Co., St. Louis, Mo.

July 13, 1917—"Increasing the Train Load." By E. H. Shaughnessy, Train Master, Galena Division, C. & N. W. Ry., W. S. Hanley, Supt., N. O. G. N. R. R., Bogalusa, La., and Chas. Burlingame, Supt., The Wiggins Ferry Co., St. Louis, Mo.

Aug. 15, 1917—"American Railways and the War." By Samuel O. Dunn, Editor of the Railway Age Gazette.

Sept. 14, 1917—"What the Railroads Are Doing to Win the War." By Richard H. Aishton, President C. & N. W. Ry.

Oct. 2, 1917—"The Ability of Refrigerator Cars to Carry Perishable Products. By Dr. M. E. Pennington, *Chief*, Food Reseach Labatory, U. S. Department of Agriculture, Bureau of Chemistry, Philadelphia, Pa.

Nov. 9, 1917—"Heart to Heart Talk on the Railroad Situation." By Edward F. Kearney, President Wabash Ry.

Dec. 7, 1917—"What We're Fighting For." By the Hon. Frederick Landis.

Jan. 11, 1918—"Railroads, Food and War." By J. F. Jarrell, Publicity Agent, A. T. & S. F. Ry., and Special Representative of the U. S. Food Administration.

Feb. 15, 1918—"The Missouri Fuel Situation." By the Hon. Wallace Crossley, Lieutenant Governor of Missouri and Federal Fuel Administrator.

Mch. 8, 1918—"The Terminal Question." By H. J. Pfeifer, Engineer, Maintenance of Way, Terminal Railroad Association, St. Louis, Mo.

Apr. 12, 1918—"Some Things We Can Do to Help Win the War." By Eugene H. Angert.

CANADIAN RAILWAY CLUB.

JAMES POWELL, 46 Aberdeen Ave., St. Lambert, near Montreal, Secretary.

May 8, 1917—Annual Meeting and Election of Officers.

Sept. 11, 1917—"Some Present Day Problems in Railway Maintenance Work." By F. B. TAPLEY, Assistant Engineer of Maintenance, Canadian Government Railways, Moncton, N.B.

Oct. 9, 1917—"Locomotive Design and Construction from a Maintenance Standpoint." By W. H. WINTERROWD, Chief Mechanical Engineer, C. P. Ry., Montreal.

Nov. 13, 1917—"Draft Gears." By PROFESSOR LOUIS ENDSLEY of the University of Pittsburgh.

Dec. 11, 1917—"Oxy-Acetylene and Electric Welding and Cutting Process in Locomotive Works." By A. F. DYER, General Foreman, Welding Department, G. T. Ry., Montreal.

Jan. 8, 1918—"Coal Situation in War Time." By T. BRITT, General Fuel Agent, C. P. Ry., Montreal.

Feb. 12, 1918—"Architecture and Building as Applied to Railway Work." By C. GORDON MITCHELL, Architect, C. N. Ry., Montreal.

Mch. 12, 1918—"Locomotive Repairs." By E. R. BATTLEY, M. M., G. T. Ry., Montreal.

Apr. 9, 1918—"Freight Brake Maintenance" By F. B. FARMER, Westinghouse Air Brake Company.

THE RAILWAY CLUB OF PITTSBURGH.

M. J. HEPBURN, 102 Penn. Station, Pittsburgh, Pa., Secretary.

Sept 28, 1917—"Ammunition Problems in War Time." By A. L. HUMPHREY, V. P. & G. M., Westinghouse Air Brake Company.

Oct. 26, 1917—Annual Meeting, Election of Officers, Smoker and Vaudeville.

Nov., 1917—"The Determining Factors in War." By the REV. SAMUEL MCCAULEY LINDSAY.

Dec. 28, 1917—"Patriotism." By BENJAMIN MOORE. "Co-operation." By W. S. DIGGS.

Jan. 25, 1918—"The Food Problem." By F. W. HUGHES. "Thrift Stamps." By JOHN E. LAUGHLIN.

Feb. 21, 1918—"Our Transportation in the Present Crisis." By JOHN F. LENT.

Mch. 22, 1918—Report of Committee on Revision of M. C. B. Rules. "Government Propaganda in the Prosecution of the War." By TIM. F. DUNN.

Apr. 26, 1918—"All in the Service." By W. H. ARMSTRONG. "Our Duty in this Crisis." By R. B. SCANDRETT.

May 25, 1918—Moving Picture—"France in Arms." Appeal for Red Cross Contributions—L. C. BIHLER.

Aug. 13, 1918—"Fued Conservation." By H. C. WOODBRIDGE, Supervisor, Fuel Conservation Section, U. S. R. R. Administration.

SOUTHERN AND SOUTHWESTERN CLUB.

A. J. MERRILL, P. O. Box 1205, Atlanta, Ga., Secretary.

July 19, 1917—"What is Required of Railroads in the Present War." By A. W. THOMPSON, V. P., B. & O. R. R.

Sept. 20, 1917—"Control of Smoke Emission." Americanization of Tony," By F. L. ERGLER, Pennsylvania R. R.

Nov. 15, 1917—"Many Advantages of a Manufacturing Tool Room to a Modern Railroad Shop." By J. H. PAINTER, A. C. L. R. R.

Jan. 17, 1918—"Car Construction and Maintenance of Ptssenger and Freight Equipment." By D. D. WILSON, G. F., Car Repairs, Southern Ry. "Duties of Car Foremen and Hoy to Keep Down Car Shortage." By C. E. PATTERSON, Foreman, Car Department, A. C. L. R. R.

Mch. 21, 1918—"Duties of Car Foremen and Their Relation to Car Shortage Equipment." By C. E. PATTERSON, Foreman, Car Department, A. C. L. R. R.

May 16, 1918—"Fuel Conservation." By A. P. WELLS, Engineer of Tests, C. A. R. of Go.,"Dynamometer Tests and Their Relation to Locomotive Efficiency." By C. M. DARDEN, M. E., N. C. & St. L. Ry.

July 18, 1918—"Shocks in Long Passenger Trains." By ROBERT BURGESS.

RICHMOND RAILROAD CLUB.

F. O. Robinson, Eighth and Main Streets, Richmond, Va., Secretary-Treasurer.

SOCIETY OF RAILWAY CLUB SECRETARIES.

The annual meeting of the Society are held in connection with the Conventions of the M. C. B. A. and A. R. M. M. Associations, but no meetings will be held until after the war.

Chairman, A. J. Merrill, Southern & Southwestern Railway Club.
Vice-Chairman, W. E. Cade, Jr., New England Railway Club.
Secretary-Treasurer, Harry D. Vought, New York Railroad and Central Railway Clubs, New York City.

The Annual Meetings of 1917 and 1918 were not held on account of the war.

MORLEY DONALDSON
DIED
August 27th, 1918

ALBERT BROMLEY SMITH
DIED
October 20th, 1918

O. W. MEISSNER, M. E.

10 St. Antoine Street

Phone Main 6697 **MONTREAL** P. O. Box 1722

CANADIAN AGENT

Buffalo Brake Beams

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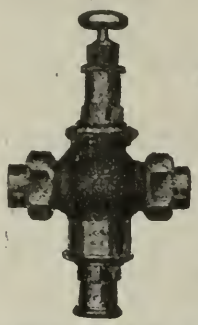

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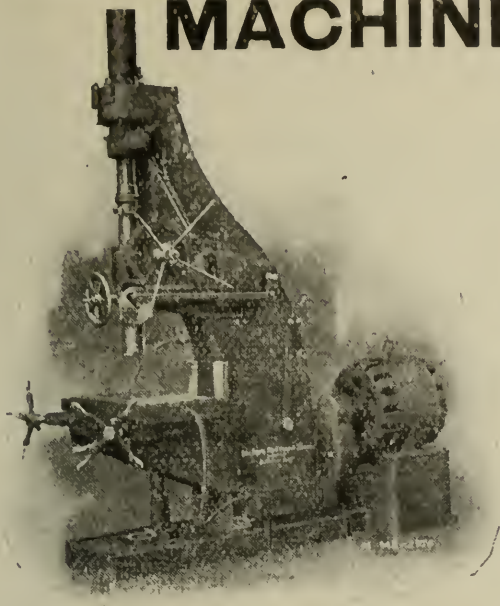

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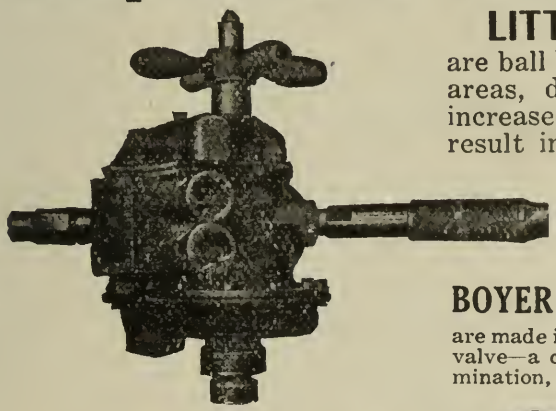

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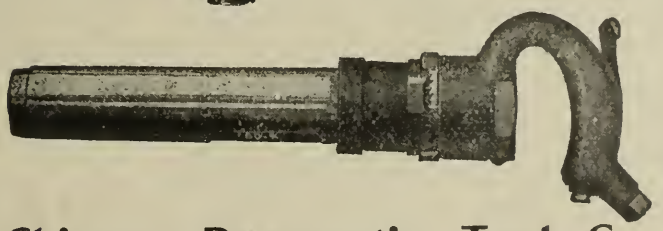

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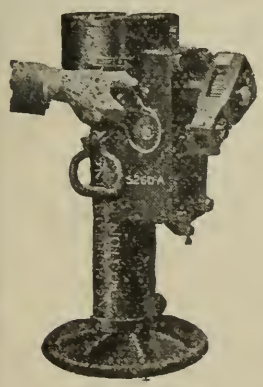

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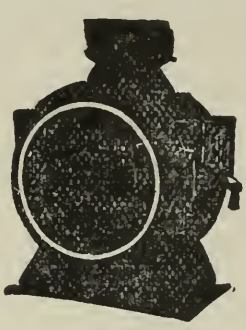

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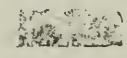

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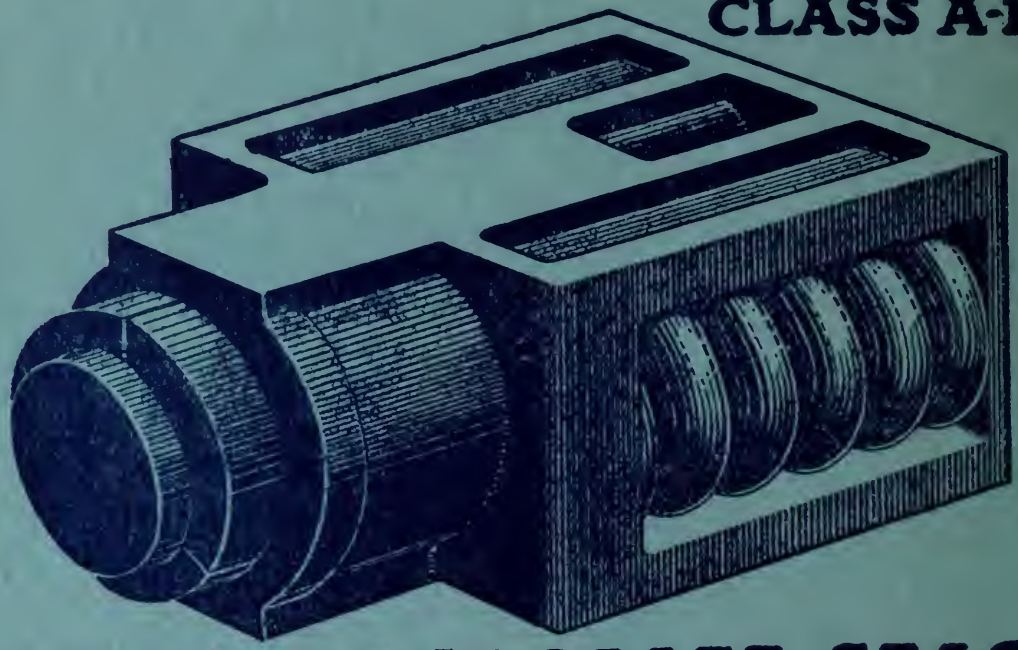

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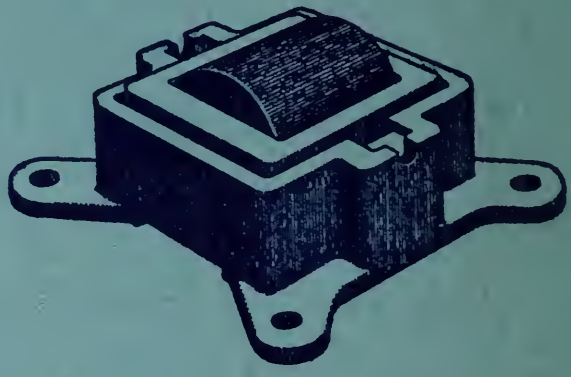

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